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Michael Stephen Saxon

Education

Arizona State University, Tempe, AZ
M.S., Computer Engineering, **3.94/4.0** *Aug 2018 - Present*
Thesis topic—Data-sparse machine learning for speech and language processing
Advisors: Visar Berisha, Ph.D. & Sethuraman Panchanathan, Ph.D.

Arizona State University, Tempe, AZ
B.S.E., Electrical Engineering, **3.60/4.0** *Aug 2014 - Aug 2018*
Minor, Mathematics

Research Interests

Natural language understanding; speech processing, synthesis, and recognition; representation learning; semi-supervised learning; assistive technologies; semantic data mining; AI governance

Publications

M. Saxon, J. Liss, V. Berisha, "A new model for objective estimation of hypernasality from dysarthric speech," Workshop on Signal Analytics for Motor Speech (SAMS), Motor Speech Conference 2020, Santa Barbara, CA, February 2020. *(Accepted)*

M. Moore, **M. Saxon**, H. Venkateswara, V. Berisha, S. Panchanathan, "Say what? A dataset for exploring the error patterns that two ASR engines make," Interspeech 2019, Graz, AT, 2019, pp. 2528-2532.

M. Saxon, J. Liss, V. Berisha, "Objective Measures of Plosive Nasalization in Hypernasal Speech," 2019 IEEE International Conference on Acoustics, Speech, and Signal Processing, Brighton, UK, 2019, pp. 6520-6524.

M. Saxon, S. Bhandari, L. Ruskin, G. Honda, "Word Pair Convolutional Model for Happy Moment Classification," 2nd Workshop on Affective Content Analysis, AAAI 2019, Honolulu, HI, 2019, pp. 111-119.

B. Gupta, **M. Saxon**, T. McDaniel, S. Panchanathan, "Chat-Box: Proposing a Mood Analyzer for Individuals with Social Interaction Disabilities," International Conference on Human-Computer Interaction, Las Vegas, NV, 2018, pp. 394-401.

T. Houghton, **M. Saxon**, Z. Song, H. Nyugen, H. Jiang and H. Yu, "2D Grating Pitch Mapping of a through Silicon Via (TSV) and Solder Ball Interconnect Region Using Laser Diffraction: IEEE Electronic Components and Technology Conference, 2016," 2016 IEEE 66th Electronic Components and Technology Conference (ECTC), Las Vegas, NV, 2016, pp. 2222-2227.

Preprints

M. Saxon, A. Tripathi, Y. Jiao, J. Liss, V. Berisha, "Robust Estimation of Hypernasality in Dysarthria," *(Under Review, IEEE Trans. on Audio, Speech, and Language Processing)* arXiv:1911.11360

Employment Summary

Applied Science Intern *(Alexa Hybrid Science)* **Amazon**
Pittsburgh, PA *May 2019 - Aug 2019*
Oversaw a research project integrating neural end-to-end spoken language understanding for intent classification for Alexa. Experimented with developing novel semi-supervised label projection methods to generate sequential labels from full-sequence class labels. Developed architectures for "semantic endpointing," stopping the forward pass once enough information has been heard.

Research Engineer Intern **Aural Analytics**
Scottsdale, AZ *Dec 2018 - Apr 2019*
Integrated cloud-based ASR and developed in-house ASR models for integration in a clinical

speech assessment product. Explored the design of deployable ASR systems robust to quality reduction under dysarthria.

Graduate Research Assistant **Arizona State University**
Tempe, AZ *Aug 2018 - Present*
Joint funding from BBHAL (Berisha) and Center for Cognitive Ubiquitous Computing (Panchanathan) (See Publications)

REU Participant **Arizona State University**
Tempe, AZ *Oct 2017 - May 2018*
NSF Center for Efficient Vehicles and Sustainable Transportation Systems: Created data acquisition code for synchronous collection of LiDAR and camera image data in C++ with a corresponding video reconstruction code for part of my Senior Design project. Assisting in the development of neural network architectures for processing LiDAR data, evaluation methologies, and principled pre-processing for LiDAR input to neural networks.

Embedded Software Engineering Intern **General Dynamics Mission Systems**
Scottsdale, AZ *May 2017 - Jul 2017*
Software-level testing for an FQT release of the HOOK3 Combat Survival Radio; Preparing reports on problems detected during testing and closing PRs; Working on an Agile development team

Undergraduate Researcher **The Luminosity Lab @ Arizona State University**
Tempe, AZ *Aug 2016 - May 2018*
Developing software for networked embedded systems; Writing pathfinding algorithms for autonomous drones in Python; Utilizing machine learning to build data analysis models; AI/ML Working Group Member

Tutor **Engineering Tutoring Center @ Arizona State University**
Tempe, AZ *Sep 2015 - Sep 2016*
Working in the Engineering Tutoring Center; Explaining concepts for freshman and sophomore level math, science, and electrical engineering classes to students who need help; Answering questions and giving homework help

Research Exchanges

Hiroshima University *May 2018 - Jul 2018*
Pose estimation models for Affective Computing with Dr. Toru Tamaki's group.
Funding provided by Center for Cognitive Ubiquitous Computing.

National University of Singapore *May 2016 - Jul 2016*
Dialog systems with Dr. Shuzhi Sam Ge's Social Robotics Lab.
Funding provided by Experiential Learning Grant.

Computer Skills

Software – Python (Pytorch, Numpy, SciPy), C/C++, OpenCV, HTK, Kaldi, Verilog, MATLAB, Linux

Selected Coursework

ML, Stats – Fundamentals of Statistical Learning; Random Signal Theory; Deep Learning for Media Processing; Information Theory
DSP, Speech, Linguistics – Digital Image/Video Processing; Speech Processing, Recognition, and Compression; Real Time DSP; Linguistics; Syntax; Semantics
Math, CS – Cryptography; Applied Computational Methods; Advanced Linear Algebra, Numerical Computing; Foundations of Algorithms